

III. REMARKS

Claims 1-17 and 19-21 are in the application. Claims 9, 11, 12, 18 and 20-21 stand rejected. Claims 1-8 are allowed. Claims 10, 13-17 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 18 has been cancelled. Claims 1, 2, 9, 11, 20 and 21 have been amended.

Claim Objections

Claims 1-2 and 21 stand objected to because of various informalities. These informalities have been corrected, thus obviating these objections.

Claim Rejections - 35 USC § 112

Claim 11 stands rejected under 35 U.S.C. 112, second paragraph, as being indefinite for the recitation “while forming undercuts”. The examiner states it is not clear if this refers to a method step or an adjectival phrase describing the anchor portions. Applicant has amended the claim to clarify the intended meaning.

Claim Rejections - 35 USC § 103

Claims 9, 18 and 20-21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hockaday et al. (US 6,236,136) in view of Burger et al. (GB 2112215). The examiner states that Hockaday teach a drum or “barrel” commutator for an electrical machine comprising a barrel-shaped support body made of insulating compression-molding

material, a plurality of metal conductor segments with terminal lugs disposed thereon, and an equal number of carbon segments which are joined to the conductor segments in electrically conductive relationship (inherent), characterized by an annular, closed, substantially regular cylindrical surface (upper part of support body 220 in Fig. 12) disposed adjacent to the terminal lugs and comprising alternating zones of compression-molding material, i.e., support body 220 and “blanked” metal shell 204. The examiner recognizes that Hockaday do not teach a metallized inner surface that belongs to the carbon segments and is joined to the support body.

The examiner states that Burger teaches a motor commutator (Fig.4) including an injection-molded sleeve, annular carbon commutator, and annular portion comprising copper and terminal tangs. Further, Burger teaches a metallized inner surface belonging to the carbon segments and joined to the support body comprising copper sintered layer 58 along the seam 55 between the annular surfaces 51 and 53. Alternatively, the layer may comprise a vapor-deposited layer, or one applied by means of a metallized bath (p.2, lines 1-9). The metal layer improves mounting of the commutator portions 50 and 52 since it enables the two pieces to be soldered together (p.2, lines 17-32 & 110-123).

The examiner states that it would have been obvious to one of ordinary skill to modify Hockaday and provide a metallized inner surface layer on the carbon segment per Burger since this would have facilitated connection of the commutator pieces to one another.

Applicant respectfully traverses this rejection.

Applicant's claim 9 calls for two specific features of particular relevance; (1) the drum commutator comprises an annular, closed, substantially regular cylindrical surface disposed adjacent to the terminal lugs and comprising alternating zones of compression-molding material and metal, and (2) the drum commutator comprises a metalized inner surface that belongs to the carbon segments and is joined to the support body.

Neither of these features is disclosed or even reasonably suggested by the cited prior art references. In particular, neither Hockaday nor Burger suggests such structure.

A careful consideration figures 11 and 12 of Hockaday demonstrates that the drum commutator does not comprise an annular, closed, substantially regular cylindrical surface disposed adjacent the terminal lugs and comprising alternating zones of compression-molding material and metal.

In applicant's commutator, the metal shell and the carbonaceous preform are cut through by slits extending into the support body so as to form individual metal and carbon segments isolated with regard to each other by air gaps.

In the Hockaday drum commutator, the surface disposed adjacent to the terminal lugs is stepped comprising zones of metal material with recesses between each two adjacent metal zones. Therefore, Hockaday does not disclose a drum commutator comprising an annular, closed, substantially regular cylindrical surface disposed adjacent the terminal

lugs and comprising alternating zones of compression-molding material and metal. As to the particular importance and benefits of this specific feature, reference is made to the paragraph bridging on pages 5 and 6 of the description.

With regard to feature (2), this feature is to be understood that the metalized inner surface is the radial inner surface (see e.g. page 4, lines 7 and 8 of the description).

As the description discusses in detail in the paragraph bridging pages 4 and 5, the (low-resistance) metallization at the radially inner surface of the carbon segments results in a superior distribution of the current flow through the entire carbon segments.

Burger does not suggest providing a metalized radial inner surface that belongs to the carbon segments and is joined to the support body in a drum commutator, which metallization has a mere current conducting function. Rather, what Burger teaches is a surface metallization of the carbon preform at its end faces where the carbon preform is to be connected with and contacted to the copper commutator portion (see page 1, lines 113 to page 2, line 5 of the reference: "... annular surfaces 51 and 53 lie adjacent to one another... Each of these annular surfaces 51 and S is provided with a layer 58 or 60 that can be soldered or welded . . .").

Burger teaches metallization where the carbon is to be connected with and contacted to the copper portion. There is no suggestion whatsoever to provide for a metallization at the radial inner surface of the carbon segments joining the support body so as to improve distribution of the current flow through the carbon segments.

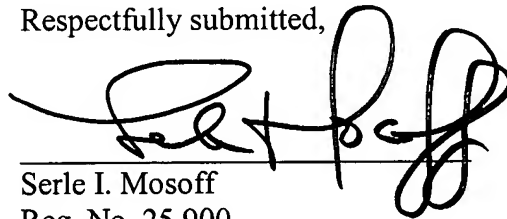
Since the two references do not render obvious claim 9, the claims dependent thereupon should also be allowable also allowable.

CONCLUSION

Applicants believe that this is a full and complete response to the Office Action. For the reasons discussed above, applicants now respectfully submit that all of the pending claims are in complete condition for allowance. Accordingly, it is respectfully requested that the Examiner's rejections be withdrawn; and that claims 6-10 be allowed in their present forms. If the Examiner feels that any issues that remain require discussion, he is kindly invited to contact applicant's undersigned attorney to resolve the issues.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,



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